(C) at least one chain extender selected from the group consisting of a C_2-C_{10} polyol having two or more hydroxyl groups and a C_2-C_{10} polyamine having two or more amino groups,

wherein said PTMG has the following characteristics (1) to (3):

(1) a number average molecular weight of from 750 to 3,500;

(2) a molecular weight distribution of 1.75 or less in terms of the Mw/Mn ratio, wherein Mw represents the weight average molecular weight of PTMG and Mn represents the number average molecular weight of PTMG; and

(3) a content of high molecular weight PTMG molecules of 10 % by weight or less, based on the total weight of all PTMG molecules, wherein said high molecular weight PTMG molecules are defined as PTMG molecules having molecular weights which are at least six times as large as the number average molecular weight of all PTMG molecules.

Please add the following claims:

--9. The polyether polyurethane according to claim 1, wherein said PTMG is produced by a method which comprises subjecting tetrahydrofuran to a polymerization reaction in a continuous polymerization reactor with a stirrer in the presence of a heteropolyacid catalyst, while feeding tetrahydrofuran to the continuous polymerization reactor,

said polymerization reaction being continuously performed in the presence of water, wherein said water is present in an amount sufficient to form a tetrahydrofuran organic phase and an aqueous tetrahydrofuran/catalyst phase which comprises a solution of the heteropolyacid catalyst in a tetrahydrofuran/water mixture and which has a specific gravity of from 1.8 to 2.3,

while maintaining a V/F value at 0.5 to 20 hours wherein V represents the volume (m^3) of the liquid in said reactor and F represents the rate (m^3/hour) of feeding tetrahydrofuran to said reactor so that the V/F value represents the retention time (hour or hours) of tetrahydrofuran in said reactor and while maintaining a P/V value at 1.3 kW or more wherein P represents the motive power (kW) applied to the liquid in said reactor and V is as defined above so that the P/V value represents the motive power (kW/m^3) applied to the liquid per unit volume thereof,

to thereby obtain a polymerization reaction mixture comprising a reaction-formed tetrahydrofuran organic phase containing a PTMG having a number average molecular weight of from 750 to 3,500 and a reaction-formed aqueous tetrahydrofuran/catalyst phase, and

separating said reaction-formed tetrahydrofuran organic phase containing said PTMG from said polymerization reaction mixture.

10. The polyether polyurethane according to claim 1 or 9,

wherein said PTMG has a heteropolyacid content of from 10 to 900 ppb by weight.

11. The polyether polyurethane according to claim 1 or 9, wherein the content of high molecular weight PTMG molecules in said PTMG is 2 to 5 % by weight.

12. A urethane prepolymer comprising:

(A) at least one polyisocyanate having two or more isocyanate groups, which is selected from the group consisting of an aromatic polyisocyanate and an aliphatic polyisocyanate; and

(B) a polyoxytetramethylene glycol (PTMG),

said urethane prepolymer having terminal isocyanate groups, wherein said PTMG has the following characteristics (1) to (3):

(1) a number average molecular weight of from 750 to 3,500;

(2) a molecular weight distribution of 1.75 or less in terms of the Mw/Mn ratio, wherein Mw represents the weight average molecular weight of PTMG and Mn represents the number average molecular weight of PTMG; and

(3) a content of high molecular weight PTMG molecules of 10 % by weight or less, based on the total weight of all PTMG molecules, wherein said high molecular weight PTMG molecules are defined as PTMG molecules having molecular weights which are at least six

times as large as the number average molecular weight of all PTMG molecules.

13. The urethane prepolymer according to claim 12, wherein said PTMG is produced by a method which comprises subjecting tetrahydrofuran to a polymerization reaction in a continuous polymerization reactor with a stirrer in the presence of a heteropolyacid catalyst, while feeding tetrahydrofuran to the continuous polymerization reactor,

said polymerization reaction being continuously performed in the presence of water, wherein said water is present in an amount sufficient to form a tetrahydrofuran organic phase and an aqueous tetrahydrofuran/catalyst phase which comprises a solution of the heteropolyacid catalyst in a tetrahydrofuran/water mixture and which has a specific gravity of from 1.8 to 2.3,

while maintaining a V/F value at 0.5 to 20 hours wherein V represents the volume (m^3) of the liquid in said reactor and F represents the rate (m^3/hour) of feeding tetrahydrofuran to said reactor so that the V/F value represents the retention time (hour or hours) of tetrahydrofuran in said reactor and while maintaining a P/V value at 1.3 kW or more wherein P represents the motive power (kW) applied to the liquid in said reactor and V is as defined above so that the P/V value represents the motive power (kW/m^3)

applied to the liquid per unit volume thereof,

to thereby obtain a polymerization reaction mixture comprising a reaction-formed tetrahydrofuran organic phase containing a PTMG having a number average molecular weight of from 750 to 3,500 and a reaction-formed aqueous tetrahydrofuran/catalyst phase, and

separating said reaction-formed tetrahydrofuran organic phase containing said PTMG from said polymerization reaction mixture.

14. The urethane prepolymer according to claim 12 or 13, wherein said PTMG has a heteropolyacid content of from 10 to 900 ppb by weight.

15. The urethane prepolymer according to claim 12 or 13, wherein the content of high molecular weight PTMG molecules in said PTMG is 2 to 5 % by weight.

16. The urethane prepolymer according to claim 12 or 13, wherein said terminal isocyanate groups are partly or wholly modified to have at least one functional group other than an isocyanate group, wherein said at least one functional group is introduced to said terminal isocyanate groups by addition.